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EXAMINER	
DHARIA, PRABODH M	

ART UNIT	PAPER NUMBER
2673	10

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/844,275	ASHIZAWA ET AL.	
	Examiner	Art Unit	
	Prabodh M Dharia	2673	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 April 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *7*.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

1. **Status:** Receipt is acknowledged of papers submitted on 11-18-2003 under amendments have been placed of record in the file. Claims 1-29 are pending in this action.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-7, 9-12,14-17,19-29, are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanaoka (4,208,869) in view of Kishita et al. (6,064,158).

Regarding Claim 1, Hanaoka teaches an EL device driving device comprising: an EL device having two electrodes (figure 6, Col. 5, Lines 37-45).

However, Hanaoka fails to teach a first EL driving IC having a first output terminal connected to one electrode of the EL device, a first input terminal, and a first controller for turning on or off an alternating current flowing between the first output terminal and the first input terminal; a second EL driving IC having a second output terminal connected to the other electrode of the EL device, a second input terminal, and a second controller for turning on or off an alternating current flowing between the second output terminal and the second input terminal; a first AC power supply for supplying an AC voltage, one electrode of the first AC power supply being connected to the first input terminal, and the other electrode of the first AC power supply being connected to a ground potential point; and a second AC power supply for supplying an AC

voltage having the same waveform as the AC voltage supplied from the first AC supply, and shifted in phase 180 degrees, and one electrode of the second AC power supply being connected to the second input terminal, End the other electrode of the second AC power supply being connected to the ground potential point.

However, Kishita et al. teaches a first EL driving IC having a first output terminal connected to one electrode of the EL device (Col. 16, lines 31-35, Col. 5, Line 27), a first input terminal, and a first controller for turning on or off an alternating current (Col. 6, Lines 1-9) flowing between the first output terminal and the first input terminal (Col. 8, Lines 10-18); a second EL driving IC having a second output terminal connected to the other electrode of the EL device (Col. 16, Lines 36,37, Col. 5, Line 27-29), a second input terminal, and a second controller for turning on or off an alternating current (Col. 6, Lines 1-9, Col. 3, Lines 19-26) flowing between the second output terminal and the second input terminal (Col. 8, Lines 42-48); a first AC power supply for supplying an AC voltage (Col. 6, Lines 1-9, Col. 5, Lines 49-54, Col. 3, Lines 19-26), one electrode of the first AC power supply being connected to the first input terminal (Col. 6, Lines 1-9, Col. 5, Lines 49-61, Col. 3, Lines 19-26), and the other electrode of the first AC power supply being connected to a ground potential point (Col. 6, Lines 1-9, Col. 5, Lines 49-61, Col. 3, Lines 19-26); and a second AC power supply for supplying an AC voltage having the same waveform as the AC voltage supplied from the first AC supply (Col. 6, Lines 1-9, Col. 5, Lines 62-67, Col. 3, Lines 19-26), and shifted in phase 180 degrees (Col. 14, Lines 56-67), and one electrode of the second AC power supply being connected to the second input terminal (Col. 14, Lines 56-67), End the other electrode of the second AC power supply being connected to the ground potential point (Col. 1, Lines 19-47).

Thus it is obvious to one in the ordinary skill in the art at the time of invention was made to incorporate teaching of Kishita et al. in Hanaoka teaching for improvements in illumination devices for an electro-optic display device and reduce power consumption.

Regarding Claim 2, Hanaoka teaches the amplitude of the AC voltage supplied (could be as high as 150V and frequency of a good EL display not larger than 1 Khz achieved) from the first AC power supply and the second AC power supply is 50V and its frequency is 400Hz (Col. 5, Lines 59-64, figure 15, Col. 9, Lines 49-56, Col. 10, Lines 62-67).

Regarding Claim 3, Hanaoka teaches an EL device driving device comprising: an EL device having two electrodes (figure 6, Col. 5, Lines 37-45).

Kishita et al. teaches a first EL driving IC having a first output terminal connected to one electrode of the EL device (Col. 16, lines 31-35, Col. 5, Line 27), a first input terminal, and a first controller for turning on or off an alternating current (Col. 6, Lines 1-9) flowing between the first output terminal and the first input terminal (Col. 8, Lines 10-18); a second EL driving IC having a second output terminal connected to the other electrode of the EL device (Col. 16, Lines 36,37, Col. 5, Line 27-29), a second input terminal, and a second controller for turning on or off an alternating current (Col. 6, Lines 1-9, Col. 3, Lines 19-26) flowing between the second output terminal and the second input terminal (Col. 8, Lines 42-48).

Regarding Claim 4, Hanaoka teaches the first EL driving IC (Col. 13 Lines 37-45) includes an output transistor having one electrode connected to the first output and the other

electrode connected to the first input terminal (Col. 11, lines 43-56), and a diode connected in parallel to the output transistor (Col. 11, lines 34-42), and the second EL driving IC (Col. 13 Lines 37-45) includes an output transistor having one electrode connected to the second output terminal and the other electrode connected to the second input terminal of the second EL driving IC (Col. 13 Lines 37-45), and a diode connected in parallel to the output transistor (Col. 11, lines 34-42).

Regarding Claim 5, Hanaoka teaches the output transistor is a bipolar transistor or a field effect transistor (Col. 13 Lines 30-45).

Regarding Claim 6, Hanaoka teaches an EL device driving device comprising: an EL device having two electrodes (figure 6, Col. 5, Lines 37-45).

However, Hanaoka fails to teach a first EL driving IC having a first output terminal connected to one electrode of the EL device, a first input terminal, and a first controller for turning on or off an alternating current flowing between the first output terminal and the first input terminal; a second EL driving IC having a second output terminal connected to the other electrode of the EL device, a second input terminal, and a second controller for turning on or off an alternating current flowing between the second output terminal and the second input terminal; a first AC power supply for supplying an AC voltage, one electrode of the first AC power supply being connected to the first input terminal, and the other electrode of the first AC power supply being connected to a ground potential point; and a second AC power supply for supplying an AC voltage having the same waveform as the AC voltage supplied from the first AC supply, and

shifted in phase 180 degrees, and one electrode of the second AC power supply being connected to the second input terminal, End the other electrode of the second AC power supply being connected to the ground potential point.

However, Kishita et al. teaches a first EL driving IC having a first output terminal connected to one electrode of the EL device (Col. 16, lines 31-35, Col. 5, Line 27), a first input terminal, and a first controller for turning on or off an alternating current (Col. 6, Lines 1-9) flowing between the first output terminal and the first input terminal (Col. 8, Lines 10-18); a second EL driving IC having a second output terminal connected to the other electrode of the EL device (Col. 16, Lines 36,37, Col. 5, Line 27-29), a second input terminal, and a second controller for turning on or off an alternating current (Col. 6, Lines 1-9, Col. 3, Lines 19-26) flowing between the second output terminal and the second input terminal (Col. 8, Lines 42-48); a first AC power supply for supplying an AC voltage (Col. 6, Lines 1-9, Col. 5, Lines 49-54, Col. 3, Lines 19-26), one electrode of the first AC power supply being connected to the first input terminal (Col. 6, Lines 1-9, Col. 5, Lines 49-61, Col. 3, Lines 19-26), and the other electrode of the first AC power supply being connected to a ground potential point (Col. 6, Lines 1-9, Col. 5, Lines 49-61, Col. 3, Lines 19-26); and a second AC power supply for supplying an AC voltage having the same waveform as the AC voltage supplied from the first AC supply (Col. 6, Lines 1-9, Col. 5, Lines 62-67, Col. 3, Lines 19-26), and shifted in phase 180 degrees (Col. 14, Lines 56-67), and one electrode of the second AC power supply being connected to the second input terminal (Col. 14, Lines 56-67), End the other electrode of the second AC power supply being connected to the ground potential point (Col. 1, Lines 19-47).

Thus it is obvious to one in the ordinary skill in the art at the time of invention was made to incorporate teaching of Kishita et al. in Hanaoka teaching for improvements in illumination devices for an electro-optic display device and reduce power consumption.

Regarding Claim 7, Hanaoka teaches the amplitude of the AC voltage supplied (could be as high as 150V and frequency of a good EL display not larger than 1 Khz achieved) from the first AC power supply and the second AC power supply is 50V and its frequency is 400Hz (Col. 5, Lines 59-64, figure 15, Col. 9, Lines 49-56, Col. 10, Lines 62-67).

Regarding Claim 9, Hanaoka teaches the EL driving IC (Col. 13, Lines 37-45) includes an output transistor having one electrode connected to the output terminal (Col. 11, Lines 43-56) of the EL driving IC (Col. 13, Lines 37-45) and the other electrode connected to the input terminal of the EL driving IC (Col. 13, Lines 37-45), and a diode connected in parallel to the output transistor (Col. 11, Lines 34-42).

Kishita et al. teaches a diode connected in parallel to the output transistor (Col. 5, Lines 36-39, Col. 10, Line 65 to Col. 11, Line 6).

Regarding Claim 10, Hanaoka teaches the output transistor is a bipolar transistor or a field effect transistor (Col. 13, Lines 30-45).

Regarding Claim 11, Hanaoka teaches an EL driving device (Col. 4, Lines 36-38) comprising: an EL device having two electrodes (figure 6, Col. 5, Lines 37-45).

However, Hanaoka fails to teach a first EL driving IC having a first output terminal connected to one electrode of the EL device, a first input terminal, and a first controller for turning on or off an alternating current flowing between the first output terminal and the first input terminal, an input terminal connected to a ground potential point; a second EL driving IC having a second output terminal connected to the other electrode of the EL device, a second input terminal, and a second controller for turning on or off an alternating current flowing between the second output terminal and the second input termina; and an AC power supply for supplying an AC voltage without superposition of direct current, one electrode of the AC power supply being connected to the other electrode of the EL device, and the other electrode of the AC power supply being connected to the ground potential point.

However, Kishita et al. teaches a first EL driving IC having a first output terminal connected to one electrode of the EL device (Col. 16, lines 31-35, Col. 5, Line 27), a first input terminal, and a first controller for turning on or off an alternating current (Col. 6, Lines 1-9) flowing between the first output terminal and the first input terminal (Col. 8, Lines 10-18), an input terminal connected to a ground potential point, (Col. 1, Lines 19-47); a second EL driving IC having a second output terminal connected to the other electrode of the EL device (Col. 16, Lines 36,37, Col. 5, Line 27-29), a second input terminal, and a second controller for turning on or off an alternating current (Col. 6, Lines 1-9, Col. 3, Lines 19-26) flowing between the second output terminal and the second input terminal (Col. 8, Lines 42-48); and an AC power supply for supplying an AC voltage without superposition of direct current (Col. 6, Lines 1-9, Col. 5, Lines 62-67, Col. 3, Lines 19-26, Col. 1, 19-47), one electrode of the AC power supply being

connected to the other electrode of the EL device, and the other electrode of the AC power supply being connected to the ground potential point (Col. 1, Lines 19-47).

Thus it is obvious to one in the ordinary skill in the art at the time of invention was made to incorporate teaching of Kishita et al. in Hanaoka teaching for improvements in illumination devices for an electro-optic display device and reduce power consumption.

Regarding Claim 12, Hanaoka teaches the amplitude of the AC voltage supplied (could be as high as 150V and frequency of a good EL display not larger than 1 Khz achieved) from the first AC power supply and the second AC power supply is 100V and its frequency is 400Hz (Col. 5, Lines 59-64, figure 15, Col. 9, Lines 49-56, Col. 10, Lines 62-67).

Regarding Claim 14, Hanaoka teaches the EL driving IC (Col. 13, Lines 37-45) includes an output transistor having one electrode connected to the output terminal (Col. 11, Lines 43-56) of the EL driving IC (Col. 13, Lines 37-45) and the other electrode connected to the input terminal of the EL driving IC (Col. 13, Lines 37-45), and a diode connected in parallel to the output transistor (Col. 11, Lines 34-42).

Kishita et al. teaches a diode connected in parallel to the output transistor (Col. 5, Lines 36-39, Col. 10, Line 65 to Col. 11, Line 6).

Regarding Claim 15, Hanaoka teaches the output transistor is a bipolar transistor or a field effect transistor (Col. 13 Lines 30-45).

Regarding Claim 16, Hanaoka teaches an EL driving device (Col. 4, Lines 36-38) comprising: an EL device having two electrodes (figure 6, Col. 5, Lines 37-45).

However, Hanaoka fails to teach an AC power supply for supplying an AC voltage without superposition of direct current, one electrode of the AC power supply being connected to the other electrode of the EL device, and the other electrode of the AC power supply being connected to the ground potential point; and a first energizing circuit for energizing a first diode connected to the other electrode of the EL device to pass current in a direction from the EL device to the AC power supply; a second energizing circuit for energizing a second diode connected to the other electrode of the EL device to pass current in a direction from the AC power supply to the EL device; and an energizing control circuit for turning on or off the first and second energizing circuits in synchronism with a positive or negative change in the AC voltage supplied from the AC power supply.

However, Kishita et al. teaches an AC power supply for supplying an AC voltage without superposition of direct current (Col. 6, Lines 1-9, Col. 5, Lines 62-67, Col. 3, Lines 19-26, Col. 1, 19-47), one electrode of the AC power supply being connected to the other electrode of the EL device, and the other electrode of the AC power supply being connected to the ground potential point (Col. 1, Lines 19-47); and a first energizing circuit for energizing a first diode connected to the other electrode of the EL device to pass current in a direction from the EL device to the AC power supply (Col. 6, Lines 1-18); a second energizing circuit for energizing a second diode connected to the other electrode of the EL device to pass current in a direction from the AC power supply to the EL device (Col. 9, Line 65 to Col. 11, Line 23); and an energizing control circuit for turning on or off the first and second energizing circuits in synchronism with a

positive or negative change in the AC voltage supplied from the AC power supply (Col. 9, Line 65 to Col. 11, Line 23).

Thus it is obvious to one in the ordinary skill in the art at the time of invention was made to incorporate teaching of Kishita et al. in Hanaoka teaching for improvements in illumination devices for an electro-optic display device and reduce power consumption.

Regarding Claim 17, Hanaoka teaches the amplitude of the AC voltage supplied (could be as high as 150V and frequency of a good EL display not larger than 1 Khz achieved) from the first AC power supply and the second AC power supply is 100V and its frequency is 400Hz (Col. 5, Lines 59-64, figure 15, Col. 9, Lines 49-56, Col. 10, Lines 62-67).

Regarding Claim 19, Kishita et al. teaches one electrode of the first diode is connected to the other electrode of the EL device; the first energizing circuit enables the other electrode of the first diode to be at the ground potential when the first energizing circuit is turned on; one electrode of the second diode is connected to the other electrode of the EL device; and the other electrode of the second diode is connected to the ground potential point (Col. 6, Lines 1-18, Col. 9, Line 65 to Col. 11, Line 23, Col. 1, Lines 19-47).

Regarding Claim 20, Kishita et al. teaches the energizing control circuit turns on the first energizing circuit, and turns off the second energizing circuit, when the AC Voltage supplied from the AC power supply is at a negative potential, and the energizing control circuit turns off the first energizing circuit, and turns on the second energizing circuit, when the AC voltage

supplied from the AC power supply is at a positive potential (Col. 6, Lines 1-18, Col. 9, Line 65 to Col. 11, Line 23, Col. 1, Lines 19-47).

Regarding Claim 21, Hanaoka teaches an EL driving device (Col. 4, Lines 36-38) comprising: an EL device having two electrodes (figure 6, Col. 5, Lines 37-45).

However, Hanaoka fails to teach when the AC voltage supplied from the first AC power supply is higher than the AC voltage supplied from the second AC power supply with the same waveform as the AC voltage supplied from the first AC power supply and shifted in phase 180 degrees and passing a current from the second AC power supply to the other electrode of the EL device through a diode connected in parallel to the output transistor within the second EL driving IC, and from one electrode of the EL device to the first AC power supply device through the output transistor in the on state connected in parallel to the diode within the first EL driving IC, when the AC voltage supplied from the first AC power supply is lower than the AC voltage supplied from the second AC power supply.

However, Kishita et al. teaches when the AC voltage supplied from the first AC power supply is higher than the AC voltage supplied from the second AC power supply (Col. 10, Line 65 to Col. 11, Line 6) with the same waveform as the AC voltage supplied from the first AC power supply (Col. 11, Lines 7-16) and shifted in phase 180 degrees (Col. 14, Lines 56-67) and passing a current from the second AC power supply to the other electrode of the EL device through a diode connected in parallel to the output transistor (Col. 10, Line 65 to Col. 11, Line 6, Col. 11, Lines 17-23) within the second EL driving IC (Col. 11, Lines 55-65, Col. 11, Line 66 to Col. 12, Line 11), and from one electrode of the EL device to the first AC power supply device

through the output transistor in the on state connected in parallel to the diode (Col. 10, Line 65 to Col. 11, Line 6) within the first EL driving IC (Col. 11, Lines 55-65, Col. 11, Line 66 to Col. 12, Line 11), when the AC voltage supplied from the first AC power supply is lower than the AC voltage supplied from the second AC power supply (Col. 11, Lines 47-65).

Thus it is obvious to one in the ordinary skill in the art at the time of invention was made to incorporate teaching of Kishita et al. in Hanaoka teaching for improvements in illumination devices for an electro-optic display device and reduce power consumption.

Regarding Claim 22, Hanaoka teaches the amplitude of the AC voltage supplied (could be as high as 150V and frequency of a good EL display not larger than 1 Khz achieved) from the first AC power supply and the second AC power supply is 50V and its frequency is 400Hz (Col. 5, Lines 59-64, figure 15, Col. 9, Lines 49-56, Col. 10, Lines 62-67).

Regarding Claim 23, Hanaoka teaches the output transistor is a bipolar transistor or a field effect transistor (Col. 13 Lines 30-45).

Regarding Claim 24, Hanaoka teaches an EL driving device (Col. 4, Lines 36-38) comprising: an EL device having two electrodes (figure 6, Col. 5, Lines 37-45).

However, Hanaoka fails to teach when the AC voltage supplied from the first AC power supply is higher than the AC voltage supplied from the second AC power supply with the same waveform as the AC voltage supplied from the first AC power supply and shifted in phase 180 degrees and passing a current from the second AC power supply to the other electrode of the EL

device through a diode connected in parallel to the output transistor within the second EL driving IC, and from one electrode of the EL device to the first AC power supply device through the output transistor in the on state connected in parallel to the diode within the first EL driving IC, when the AC voltage supplied from the first AC power supply is lower than the AC voltage supplied from the second AC power supply.

However, Kishita et al. teaches when the AC voltage supplied from the first AC power supply is higher than the AC voltage supplied from the second AC power supply (Col. 10, Line 65 to Col. 11, Line 6) with the same waveform as the AC voltage supplied from the first AC power supply (Col. 11, Lines 7-16) and shifted in phase 180 degrees (Col. 14, Lines 56-67) and passing a current from the second AC power supply to the other electrode of the EL device through a diode connected in parallel to the output transistor (Col. 10, Line 65 to Col. 11, Line 6, Col. 11, Lines 17-23) within the second EL driving IC (Col. 11, Lines 55-65, Col. 11, Line 66 to Col. 12, Line 11), and from one electrode of the EL device to the first AC power supply device through the output transistor in the on state connected in parallel to the diode (Col. 10, Line 65 to Col. 11, Line 6) within the first EL driving IC (Col. 11, Lines 55-65, Col. 11, Line 66 to Col. 12, Line 11), when the AC voltage supplied from the first AC power supply is lower than the AC voltage supplied from the second AC power supply (Col. 11, Lines 47-65).

Thus it is obvious to one in the ordinary skill in the art at the time of invention was made to incorporate teaching of Kishita et al. in Hanaoka teaching for improvements in illumination devices for an electro-optic display device and reduce power consumption.

Regarding Claim 25, Hanaoka teaches the amplitude of the AC voltage supplied (could be as high as 150V and frequency of a good EL display not larger than 1 Khz achieved) from the first AC power supply and the second AC power supply is 50V and its frequency is 400Hz (Col. 5, Lines 59-64, figure 15, Col. 9, Lines 49-56, Col. 10, Lines 62-67).

Regarding Claim 26, Hanaoka teaches the output transistor is a bipolar transistor or a field effect transistor (Col. 13 Lines 30-45).

Regarding Claim 27, Hanaoka teaches an EL driving device (Col. 4, Lines 36-38) comprising: an EL device having two electrodes (figure 6, Col. 5, Lines 37-45).

However, Hanaoka fails to teach passing a current from a AC power supply to one electrode of an EL device, and from the other electrode of the EL device to the ground through an output transistor in the on state within an EL driving IC, when the AC voltage; and an AC power supply for supplying an AC voltage without superposition of direct current is higher than a ground potential; and Passing a current from the ground potential point to other electrode of an EL device, and from the other electrode of the EL device to the ground through an output transistor in the on state within an EL driving IC, when the AC voltage; and an AC power supply for supplying an AC voltage without superposition of direct current is lower than a ground potential.

However, Kishita et al. teaches passing a current from a AC power supply to one electrode of an EL device (Col. 6, Lines 1-9, Col. 3, Lines 19-26, Col. 11, Lines 17-21), and from the other electrode of the EL device to the ground through an output transistor in the on

state within an EL driving IC, when the AC voltage (Col. 8, Lines 42-48); and an AC power supply for supplying an AC voltage without superposition of direct current is higher than a ground potential (Col. 6, Lines 1-9, Col. 5, Lines 62-67, Col. 3, Lines 19-26, Col. 1, 19-47, Col. 11, Line 66 to Col. 12, Line 7); and Passing a current from the ground potential point to other electrode of an EL device (Col. 10, Line 65 to Col. 11, Line 15), and from the other electrode of the EL device to the ground through an output transistor in the on state within an EL driving IC, when the AC voltage (Col. 11, Lines 7-65); and an AC power supply for supplying an AC voltage without superposition of direct current is lower than a ground potential (Col. 6, Lines 1-9, Col. 5, Lines 62-67, Col. 3, Lines 19-26, Col. 1, 19-47, Col. 11, Line 66 to Col. 12, Line 7, Col. 10, Line 65 to Col. 11, Line 15).

Thus it is obvious to one in the ordinary skill in the art at the time of invention was made to incorporate teaching of Kishita et al. in Hanaoka teaching for improvements in illumination devices for an electro-optic display device and reduce power consumption.

Regarding Claim 28, Hanaoka teaches the amplitude of the AC voltage supplied (could be as high as 150V and frequency of a good EL display not larger than 1 Khz achieved) from the first AC power supply and the second AC power supply is 100V and its frequency is 400Hz (Col. 5, Lines 59-64, figure 15, Col. 9, Lines 49-56, Col. 10, Lines 62-67).

Regarding Claim 29, Hanaoka teaches the output transistor is a bipolar transistor or a field effect transistor (Col. 13 Lines 30-45).

4. Claim 8,13,18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanaoka (4,208,869) in view of Kishita et al. (6,064,158) as applied to claims 1-7, 9-12, 14-17, 19-29 above and further in view of Skeki et al. ((JP 2000-047638).

Regarding Claim 8, Hanaoka teaches the plurality of EL devices are provided (Col. 3, Lines 3-7); the EL driving IC (Col. 3, Lines 3-7).

However, Hanaoka modified by Kishita et al. fails to teach the plurality of output terminals and the plurality of controllers for turning on or off the alternating current corresponding to the plurality of EL devices respectively; the plurality of output terminals for the EL driving circuitries are connected to one electrodes of the plurality of EL devices respectively; the one electrode for the first AC power supply is connected to the other electrodes of the plurality of EL device; the controllers are configured to turn on or off the alternating current flowing between each of the plurality of output terminals and the input terminal.

However, Sukeki et al. teaches the plurality of output terminals (pages 4,5, paragraph 30) and the plurality of controllers for turning on or off the alternating current corresponding to the plurality of EL devices respectively (page 2, paragraphs 8,9,10); the plurality of output terminals for the EL driving circuitries are connected to one electrodes of the plurality of EL devices respectively (pages 1,2 paragraphs 6-10); the one electrode for the first AC power supply is connected to the other electrodes of the plurality of EL devices (page 2, paragraphs 8,9,10); the controllers are configured to turn on or off the alternating current flowing between each of the plurality of output terminals and the input terminal (page 2, paragraphs 8,9,10).

Thus it is obvious to one in the ordinary skill in the art at the time of invention was made to incorporate teaching of Sukeki et al. in Hanaoka modified by Kishita et al. teaching for improvements in illumination devices for an electro-optic display device.

Regarding Claim 13, Hanaoka teaches the plurality of EL devices are provided (Col. 3, Lines 3-7); the EL driving IC (Col. 3, Lines 3-7).

Sukeki teaches the plurality of output terminals (pages 4,5, paragraph 30) and the plurality of controllers for turning on or off the alternating current corresponding to the plurality of EL devices respectively (page 2, paragraphs 8,9,10); the plurality of output terminals for the EL driving circuitries are connected to one electrodes of the plurality of EL devices respectively (pages 1,2 paragraphs 6-10); the one electrode for the first AC power supply is connected to the other electrodes of the plurality of EL devices (page 2, paragraphs 8,9,10); the controllers are configured to turn on or off the alternating current flowing between each of the plurality of output terminals and the input terminal (page 2, paragraphs 8,9,10).

Regarding Claim 18, Hanaoka teaches the plurality of EL devices are provided (Col. 3, Lines 3-7); the EL driving IC (Col. 3, Lines 3-7).

Sukeki teaches the plurality of output terminals (pages 4,5, paragraph 30) and the plurality of controllers for turning on or off the alternating current corresponding to the plurality of EL devices respectively (page 2, paragraphs 8,9,10); the plurality of output terminals for the EL driving circuitries are connected to one electrodes of the plurality of EL devices respectively (pages 1,2 paragraphs 6-10); the one electrode for the first AC power supply is connected to the

other electrodes of the plurality of EL devices (page 2, paragraphs 8,9,10); the controllers are configured to turn on or off the alternating current flowing between each of the plurality of output terminals and the input terminal (page 2, paragraphs 8,9,10).

Response to Arguments

5. Applicant's arguments filed 11-18-2003 have been fully considered but they are not persuasive.

6. Applicant's arguments with respect to claims 1,11,16,24,27 have been considered but are moot in view of the new ground(s) of rejection.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Applicant is informed that all of the other additional cited references render the claims obvious.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Flegal et al. (4,982,183) Alternate polarity symmetric drive for scanning electronic in a split-screen AC TFEL display device.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prabodh M Dharia whose telephone number is 703-605-1231. The examiner can normally be reached on M-F 8AM to 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on 703-3054938. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9341 for regular communications and 703-872-9341 for After Final communications.

10. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

PD

AU2673

December 30, 2003

VIJAY SHANKAR
PRIMARY EXAMINER